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Division of Mycology and Disease Survey

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THE PLANT DISEASE REPORTER

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THE PLANT DISEASE SURVEY

DIVISION OF MYCOLOGY AND DISEASE SURVEY

Volume XXIII Number 10

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DISEASES OF FRUITS AND VEGETABLES ON THE NEW YORK MARKET DURING THE MONTHS OF JANUARY, FEBRUARY, AND MARCH, 1939

C. O. Bratley and James S. Wiant

APPLES:

Injury from washing solutions was noted somewhat less frequently on apples during the first three months of 1939 than during a similar period of the previous year. The only injury noted was in lots of large size Delicious apples from the Pacific Northwest in which an occasional fruit in most shipments showed slight injury in the calyx cavity. In these large apples the calyx cavities were unusually deep, making it difficult to thoroughly rinse them after washing.

Sporotrichum rot (Sporotrichum sp.) was found in smaller quantities on apples from Virginia than during any of the past three seasons.

Scald (physiological), that was almost entirely confined to the skin in the stem cavities, was found affecting 20 percent of the fruit in two lots of McIntosh apples from the Hudson Valley during January.

Delayed sunburn affecting 1 to 2 percent of the fruit was found in several cars of Yellow Newtown apples from Oregon. This injury was seen also on the blush side of British Columbia McIntosh apples in a sample said to be typical of about 30 percent of the fruit in several carlots coming into Boston.

Bulls-eye rot (Gloeosporium perennans or Neofabraea malicorticis) was found affecting 1 to 2 percent of the fruit in Yellow Newtown apples from Oregon. Less than usual amounts of this decay have been seen this season.

During February and March, small black lesions of apple scab (Venturia inaequalis) typical of those developing in storage were found in large numbers on Stayman and Rome apples from Pennsylvania, White Pippin apples from New Jersey, Baldwin and Stark apples from the Hudson Valley and Baldwin apples from New England. Some of these lots, which were said by the shippers to be free from visible scab when stored, were more severely infected than any apples we have seen heretofore on this market.

ARTICHOKES:

Field freezing of California artichokes which constituted a serious market blemish during early March was evidenced by a tan discoloration of the exposed tips of the scales, accompanied by a blistering and peeling off of the epidermis in that region.

CABBAGE:

From time to time during the period covered by this report, Texas cabbage was found seriously blemished with edema-like warts on both the upper and lower surfaces of about one-third of the outer leaves per head. The protuberances varied from pin-point size to several millimeters in diameter. Frequently they coalesced to form irregular, roughened ridges. White at first, they later turned dark and so gave the leaves an unsightly appearance. Thrips (Thrips tabaci) were in all cases associated with this condition. Mr. J. C. Crawford of the Bureau of Entomology and Plant Quarantine, who identified the species involved, reported that the blemishes here described were undoubtedly the result of a response by the plant to the feeding injuries made by the insect.

CUCUMBERS:

Certain shipments of cucumbers from Puerto Rico arrived in poor condition during January, February, and March. It was not unusual to find from 5 to 20 percent decay in some lots. Occasionally as many as 50 to 60 percent of the fruits bore from one to several lesions. Apparently most of the decay was mycosphaerella black rot caused by Mycosphaerella citrullina.

Bacterial spot (Bacterium lachrymans) was found occasionally in small percentages in Puerto Rican stock.

At irregular intervals a shallow surface pitting was observed on Puerto Rican cucumbers. In general appearance it resembled low-temperature breakdown although the exact nature of the trouble is yet to be determined.

Cuban cucumbers arrived, for the most part, in sound condition.

EGGPLANT:

An interesting case of low-temperature breakdown was observed in samples of eggplants received in early January from a fruit and vegetable inspector at Rochester, New York. The fruits, which had been stored at a temperature of 32°F. for four weeks, were flabby, brown both externally and internally, and the tissues were found to be water-soaked. There was no suggestion of freezing injury and all evidence indicated that the abnormal condition was the result of long exposure to low temperatures that were however well above the freezing point of the commodity.

GRAPEFRUIT:

Market arrivals of Texas grapefruit during the 3 months under consideration showed an average loss from penicillium decay of between 1 and 2 percent. Some lots were free from the disease, but many of those examined contained 3 to 5 percent and in three cases 18 to 20 percent decay.

Watersoaked areas in the rind affecting 1 to 5 percent of the fruit were found in many shipments of Texas grapefruit. Most of these were associated with either severe box scald (oil spotting on crushed fruit) or distortion of the fruit due to tight packing. Apparently the juice sacs and segment walls had been ruptured thus allowing the juice to penetrate the albedo tissue.

Florida grapefruit arrived for the most part in good condition. In each of three instances, however, 4 percent penicillium decay was observed.

HONEY DEW MELONS:

Chilean melons shipped under ventilation arrived for the most part in good condition so far as decay was concerned. Fusarium rot (Fusarium scirpi var. compactum, and other species) was at times important as a stem-end decay. Occasional melons were found affected with charcoal rot (Rhizoctonia bataticola), diplodia rot (Diplodia natalensis), pink mold rot (Cephalothecium roseum), and bacterial soft rot. However, the heavy losses from decay noted during certain previous seasons did not occur. Undoubtedly this has been in measure due to the practice of shipping less mature melons - the effects of which have been reflected in the poorer eating quality of the melon.

IRISH POTATO:

Tuber ring rot (Phytomonas sepedonica [Bacterium sepedonicum]) was noted only rarely in Maine stock.

Fewer samples of Idaho potatoes were brought in for differentiation between floor bruising and freezing injury than in former years.

New potatoes arriving on the New York City market from South Florida during the three months were in good condition. In this respect they were similar to those received last year and far better than those received in 1936 and in 1937. Throughout the season no decay occurred in lots from some shippers whereas from other shippers in the same locality an occasional lot contained from 4 to 15 percent of bacterial soft rot (Bacillus sp.). In an attempt to correlate the prevalence of decay with weather conditions, it was learned that the weather had been either warm and cloudy or warm with showers just before or during the time shipment was made of the lots showing decay on arrival. Too few of these lots were traced back to justify a general statement but it is suggested that the general dry weather which prevailed was partly responsible for the arrival of the potatoes in good condition. In this connection it is interesting to note that the rainfall during the three months was 57 percent of normal.

LEMONS:

Lemons arriving from California during January and February showed no more than the usual amounts of penicillium decay. During the latter part of March, however, cars were observed in which 4, 4, 5, 10, 10, 10, and 15 percent of the fruits respectively were affected.

Species of Phomopsis and Diplodia were isolated from decayed areas at the stem end of lemons in a car shipped from California to Boston in February. Two percent of the fruit in this shipment was said to be affected.

LETTUCE (ROMAINE):

Throughout the period covered by this report attention has been drawn from time to time to the brown, dried out appearance of the tips of the outer leaves of certain lots of Florida romaine. Although frequently accompanied by one or more of the leaf spots, the browning was too extensive to be caused by the presence of the leaf spots. Indications are that the trouble had its origin in the field rather than during the transit period.

Downy mildew (Bremia lactucae) was found occasionally affecting the outer leaves of Florida romaine.

LIMA BEAN:

Scab (Elsinoe phaseoli) continued to be the most important disease of lima beans received from Cuba. Probably an average of 1 to 2 percent of the pods were regularly found affected throughout the season.

Likewise on Cuban beans, pod spot (Diaporthe phaseolorum) was found at times in small amount and on rare occasions anthracnose (Colletotrichum truncatum) was observed.

NECTARINES AND PLUMS:

Gray mold rot (Botrytis sp.) was found to be the chief decay in Chilean nectarines shipped to this market under refrigeration. Rhizopus soft rot (Rhizopus sp.) was, however, nearly as important.

Plums in several shipments from Argentina were badly shriveled at the stem end. Blue mold rot (Penicillium sp.) was the most prevalent decay in them.

ORANGES:

During February, 20 to 50 percent of the fruit in 3 cars of Navel oranges from Southern California were severely pitted on the stem-end half of the fruit. The pits were about 1/4 inch in diameter and were abruptly sunken.

In small size Florida fruits, skin breakdown was found affecting large areas around the stem in many lots of natural-color Pineapple oranges during February and in shipments of "color added" Valencia oranges during March.

Brown rot (Phytophthora citrophthora) was found more frequently in California oranges during January and February than in recent years. Although many shipments contained an occasional brown-rotted orange, in no lot did the decay affect more than 2 percent of the fruit.

During the period covered by this report a number of cars of Florida oranges were seen which had become over-heated in transit. On arrival the crate materials, stem parts and dead scale on the fruit were covered with fluffy mold growth. Penicillium rots affected from 1 to 4 percent of the fruit. Temperatures of the fruit in the top of the load were 65°F. or above. These cars had been loaded with warm fruit and shipped with initial ice only.

For the most part Temple oranges from Florida were in good condition on arrival. However, an occasional shipment contained some penicillium rot, one lot showing 30 percent of this decay.

PEARS:

Williams pears from Argentina arriving in New York City during February and March were in better condition than usual. Some fruits from the first shipments failed to ripen because of immaturity, and several lots in the last shipments were overripe. Gray mold (Botrytis sp.) was scattered throughout the shipments but affected less than 1 percent of the fruit. Much of the fruit was of rough texture and some fruits, upon cutting, were found to contain scattered corky areas deep in the flesh. Throughout the shipments an occasional fruit was found affected at stem punctures with a slowly developing cladosporium decay (Cladosporium sp.).

PINEAPPLES:

The "smoked" crop of Puerto Rican pineapples which arrived during February and March showed the usual amounts (from 1 to 5 percent) of black rot (Thielaviopsis paradoxa). Splitting and gumming between basal fruitlets were again common particularly in fruit shipped from the interior of the Island.

SPINACH:

White rust (Albugo occidentalis) constituted an important blemish of Texas spinach, particularly during the latter part of the season.

Downy mildew (Peronospora effusa) continued to have an irregular but important occurrence throughout the season.

Heterosporium leaf spot (Heterosporium variable) was found in small amounts in a few carlots but was not of much commercial importance.

TANGERINES:

During the early part of the winter, Florida tangerines showed considerable loss from penicillium decay (mostly Penicillium digitatum) and stem end rots (Diplodia natalensis and Phomopsis citri). Fruits from late bloom arriving during February and March were in much better condition.

TOMATO:

Phoma rot (Phoma destructiva) was the most common decay observed on Cuban tomatoes. Usually it was found in early stages at the edges of the stem scar. Bacterial soft rots constituted the second most important decay. Bacterial spot (Bacterium vesicatorium) was regularly found as an important blemish.

(Division of Fruit and Vegetable Crops and Diseases).

THE UTAH TOMATO DISEASE SITUATION IN 1938

H. Doran Blood and Roy M. Christiansen

At the beginning of the 1938 harvesting season a survey of Utah tomato fields was made in cooperation with the field men of the canning companies operating in the State. The aid of the field men was requested to make possible the collection of information on the seed source, the plant source, and the variety for each field surveyed. The prevalence of the three major diseases; curly top, verticillium wilt, and bacterial canker, was ascertained for the most part by direct count.

It is difficult to assign an accurate monetary value to the destruction caused by a plant disease due to the fact that the crop increment destroyed by the disease, had it been possible to have harvested it, would have increased the supply and might have depressed the market; with the result that it might have brought a lower return per unit than the portion actually harvested. However, based upon the market value of the tomato crop processed for the year 1938, the Utah tomato industry suffered a loss of approximately $750,000 from tomato diseases. The direct loss to the farmers of the relatively small tomato-producing section of the State was approximately $135,000. During the survey 180 fields distributed in all the tomato-growing districts of the State comprising a total of 645 of the 5,100 acres under cultivation were examined. The survey data are summarized in Table 1.

Table 1. Distribution of bacterial canker, curly top, and verticillium wilt of tomato in Utah - 1938.

County	District	Number of Fields Surveyed	Acreage	Percentage of disease: Bacterial Canker	Curly Top	Verticillium Wilt
Box Elder	Perry	3	4.5	17.1	4.8	5.0
	Brigham City	1	7.0	.5	8.5	5.0
	Corrine	4	27.0	30.9	3.2	17.0
	Burt	2	18.0	.1	3.8	60.0
	Honey Ville	4	12.0	2.4	3.7	8.3
County Totals		14	68.5	13.8	4.1	24.8
Weber	Roy	13	32.5	9.0	3.7	57.7
	Hooper	10	27.7	4.5	18.8	37.2
	Orchard	5	18.0	3.1	7.1	7.1
	Riverdale	8	14.2	3.2	5.5	45.0
	Wasatch	3	15.5	20.3	6.2	39.5
	West Ogden	5	12.0	2.5	7.0	47.8
	Slaterville	3	9.0	5.8	2.2	25.0
	Ogden	8	32.5	8.3	3.9	20.6
	North Ogden	11	17.0	6.8	3.9	12.5
	Plain City	4	7.5	20.5	7.9	9.0
County Totals		70	186.0	8.2	7.0	32.5
Davis	Layton	12	92.5	9.3	4.0	40.1
	Clearfield	22	94.5	6.5	4.8	45.3
	Syracuse	13	46.5	12.3	9.8	51.9
	West Point	1	3.0	0.0	19.0	70.0
	Clinton	11	46.0	.3	3.8	50.3
County Totals		59	282.5	8.0	5.5	45.8
Utah	Salem	5	12.0	.3	1.2	58.6
	Mapleton	4	15.0	.5	2.0	3.6
	Springville	10	25.5	.5	2.2	9.0
	Lake View	8	24.0	.9	5.0	48.3
	Vineyard	6	16.0	.3	5.3	41.6
	Orem	4	15.5	8.7	4.0	44.7
County Totals		37	108.0	1.7	3.4	32.4
State Totals			645.0	7.6	5.4	37.5

Curly Top (Virus)

Curly top was observed on a few plants in practically every field of tomatoes surveyed in the State. The disease did not reach epidemic proportions.

The survey indicated that about 5 percent of the tomato plants of the State were infected with curly top. The disease was observed in greatest abundance in Weber County and the northern part of Davis County. These regions are nearest the Promontory Point and Little Mountain breeding grounds of the beet leaf-hopper (Eutettix tenellus Baker). The Hooper district with 18.8 percent and the West Point district with 19 percent of their tomato plants infected are the two tomato-producing districts nearest, and directly in the line of the prevailing winds from, the leaf-hopper breeding grounds. These districts were once prize tomato producing areas, but they have been virtually eliminated by the curly top disease. The breeding areas south of the Great Salt Lake from which the insects migrate into Utah County appear to have contributed fewer migratory insects than the northern breeding areas. In general, throughout the State those districts nearest the breeding areas to the west, both north and south of the Great Salt Lake, were most heavily infected with curly top. Such a distribution of the disease is the usual occurrence in Utah[1/].

Verticillium Wilt (Verticillium alboatrum Reinke and Berth.)

Approximately 37.5 percent of the tomato plants of the State were infected with verticillium wilt. This represents a marked increase over the 1937 figure of 12.1 percent. Verticillium wilt is becoming an increasingly more serious problem from year to year. The districts showing the highest degree of wilt infestation are, in general, those where tomatoes have been cultivated most intensively and continuously since they were first grown in the State for canning purposes in 1888.

Verticillium wilt, as it appears in Utah, is not usually fatal but results in a marked reduction in the yield of the infected plant. When plants are infected while they are still young, they produce a few small unmarketable fruits of poor quality. Plants infected later in the season produce some marketable fruits but in all cases of infection, except in those that occur very late in the season, evident reduction in yield occurs. The destruction appears to be directly proportional to the earliness and the severity of the infection. Infected plants generally were estimated conservatively as having been reduced in productivity by one-third.

The source of the plants seemed to have very little influence on the subsequent development of the disease in the fields. In 71 fields comprising

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1/ Blood, H. L. The Utah tomato disease situation in 1935. U. S. Dept. Agr. Plant Disease Reporter 20: 96-102. 1936.

273.5 acres planted with home grown plants, 38.27 percent of the plants were infected with wilt. In 75 fields comprising 263.5 acres planted with plants shipped in from the fields of the Moapa Valley, Nevada, 35.6 percent were infected with wilt. This difference is insignificant, consequently it would be improper to assume that the Moapa Valley plants were freer from infection than the home grown plants or that either group of plants was more susceptible to infection than the other.

Bacterial Canker (Aplanobacter michiganense E. F. S.)

Bacterial canker was worse this year than in any year since the adoption of fermentation during seed extraction or the acetic-acid seed treatment for the control of the disease, although the disease was serious in 1937. In 1937 6.7 percent, and in 1938 7.6 percent of the plants were infected with the disease. Reports began to come in early to the effect that the fields were showing an appreciable amount of the disease. The relatively severe infestation of the past two years was felt to have a common cause. For that reason a special effort was made during the survey to obtain information on seed and plant sources for each planting.

It became evident as the survey progressed, that much of the bacterial canker disease had developed in fields planted with locally grown plants. The tomato plants were grown from seed produced by a local canning company and by a number of prominent seed houses and planted in the open fields of the Moapa Valley in southern Nevada, either in seed beds of commercial producers of plants for sale to the tomato growers, or in private beds of some farmers for the production of their own plants. A few farmers grow their own plants from seed of their own selection. There was no apparent difference in the development of canker in plants from commercial or home selected seed planted in commercial or private beds. There was a very marked difference, however, in the amount of canker which developed in fields planted with Moapa Valley plants as compared with fields planted with home grown plants whether from commercial or private beds. In 78 fields comprising 280 acres reported to have been planted with home grown plants, 14.2 percent of the plants were infected with bacterial canker. The plants in 6 fields developed between 20 and 29 percent disease, in one field 30 percent disease, in 5 fields between 40 and 49 percent disease, in 4 fields between 50 and 59 percent disease, in 2 fields between 60 and 69 percent disease, in 3 fields between 80 and 89 percent disease, and in 3 fields between 90 and 100 percent disease.

In 78 fields comprising 282.5 acres reported to have been planted with plants from Moapa Valley, Nevada, only 1.5 percent of the plants were infected with bacterial canker. The plants in 47 fields were not infected at all, in 24 fields the plants developed from a trace to 1.9 percent disease, in 6 fields from 2 to 3.9 percent disease, in 4 fields from 4 to 5.9 percent disease, in 2 fields from 6 to 7 percent disease, and in one field

16 percent of the plants developed the disease. The use of home grown plants in many cases for resetting misses in fields planted with Moapa plants would account for some of the 1.5 percent canker which developed in fields originally planted with Nevada plants. Definite information on the source of plants for resetting could not always be obtained.

Seed used for planting the Moapa Valley seed beds and most of the local commercial and private seed beds came from the same sources. For this reason the conclusion was reached that the local seed beds were responsible for the major portion of the trouble experienced with the bacterial canker disease in the State for the past two years. As a result of this information, many of the local commercial plant growers have made a serious effort to clean up their seed beds. The results of that campaign in the 1939 tomato crop will be watched with interest.

(Division of Fruit and Vegetable Crops and Diseases).

SPINDLE SPROUT IN POTATOES ON LONG ISLAND

F. M. Blodgett

Within the past two weeks the Farm Bureau agents in Nassau and Suffolk Counties have investigated reports of poor stands in certain potato fields and found that in a number of fields planted with certified Green Mountain seed from central Maine, an average of about 50 percent of the potatoes were sprouting with very slender sprouts or were not sprouting at all. Similar conditions have been observed in the past but at rather rare intervals. Stewart reports a similar occurrence on Long Island in 1914 from home grown seed. Many fields were observed in the South in the spring of 1938 in fields planted with seed from the north central States.

Such a condition might arise from a variety of causes and it is not possible to be certain which is responsible for the present outbreak until the plants have developed further. It is known that such a condition is very common when tubers affected with leaf roll are planted and recent experience indicates that it may occur in newly affected Green Mountains without the appearance of net necrosis symptoms such as were evident in 1938. It would be unusual for such a high percentage of leaf roll to occur in certified potatoes though not impossible if the conditions for spread of this disease had been very favorable in the area where the seed were produced. In the case occurring in the north central States, some attributed the occurrence to the purple top disease and others to the hot weather during tuberization. It did not seem to be perpetuated in the seed as with most virus diseases.

Since it appears that several different causes may bring about this condition, the best method of guarding against similar experiences would

seem to be a sprouting test in advance of planting as recommended by Stewart in 1915 and as recently adopted in the north central States. This might be made by the certifying agency, the dealer, or the purchaser of seed potatoes.

(From New York State College of Agriculture Departments of Entomology and Plant Pathology Weekly News Letter. May 22).

REPORTS ON VEGETABLE DISEASES IN NEW YORK

(Reports from Weekly News Letter, May 22)

ONION SMUT AND DOWNY MILDEW IN THE MUCK CROP AREAS: Onion smut [Urocystis cepulae] could be found in all counties visited last week (May 18) but is much less abundant on check plots than in the past two seasons. As onions are well past the susceptible stage it is safe to say losses from this disease will be light this year, due to the absence of rain since planting commenced. Onion mildew [Peronospora destructor] was found for the first time May 19 on top sets and has been sporulating since freely in widely separated counties of Wayne and Tompkins during the periods of showers. This is exactly one month later than its appearance a year ago. (A. G. Newhall, Dept. Plant Pathology. Weekly News Letter, May 22.)

TRUCK CROP DISEASES ON LONG ISLAND: Suffolk County. Pea aphids can be found on about 10 percent of pea plants, with an estimated population of about twenty aphids per 100 plants. Initial mosaic infection on peas is not uncommon, and migration from clover and alfalfa hosts is continuing. (H. C. Huckett, L. I. Research Farm, May 13. Weekly News Letter, May 22.)

Nassau County: Blue mold [downy mildew caused by Peronospora effusa] was found on winter-sown spinach in Wantagh on May 6, and on spring spinach in Valley Stream on May 19. Drop [Sclerotinia sp.] has caused an average loss of approximately 3 percent of the coldframe lettuce in the county, with individual losses being as high as 50 percent. Downy mildew [Peronospora brassicae] was found on radishes in Valley Stream on May 8, but it was causing no appreciable damage. Pea aphis are slowly increasing in abundance, but they are still relatively scarce for this time of year. Some growers are dusting with 3/4 percent rotenone to control the aphis. No more than one percent of the plants show symptoms of pea mosaic at the present time. Nearly all plants in five acres of cabbage were found to be infected with blackleg [Phoma lingam] on May 18. The plants were all imported from the south, and the disease likely spread among them during shipment. (Orson S. Cannon, Weekly News Letter, May 22.)

FLAX RUST IN TEXAS

G. E. Altstatt

Flax rust, Melampsora lini, was first reported this year on March 16 at El Campo in Wharton County in fields sown in November, 1938. Since then it has been found in Jackson, Colorado, Fayette, Lavaca, and Brazos Counties. Generally the infection has been very light except in Wharton and Jackson Counties. However, the disease is rather widespread considering the fact that this is only the second year that flax has been grown on a commercial basis in the State.

In Wharton County all of the fields of early flax contained some rust. One field in particular was found heavily infested and on March 17 it appeared that the disease would reduce the crop by at least 75 percent. The denser stands of flax were more severely attacked. Subsequent observation on April 6 after continued drought, however, showed little change in the condition of these plants. At harvest on May 4 it was observed that the flax seed produced in an area of heavy infection was noticeably smaller and lighter than that harvested from areas of lighter infection in the same field. Continued dry weather probably decreased the amount of rust although considerable new infection showed up on young flax in certain fields. The estimated loss at harvest was from 15 to 25 percent.

Late flax in Wharton County on March 17 showed very little infection; yet every field visited had a trace of rust. By May 4, at time of flowering, the infection had developed from a trace to 75 percent or more. The Bison variety is planted exclusively in the above areas.

The flax acreage in Texas has jumped from 800 acres last year to 17,000 acres this year.

(Division of Plant Pathology and Physiology, Texas Agricultural Experiment Station, A. & M. College of Texas.)

DISEASES OF CEREALS IN GEORGIA

J. H. Miller

Wheat

Leaf rust (Puccinia triticina [P. rubigo-vera tritici]) was from two to three weeks later than usual in appearing in middle and north Georgia. In south Georgia it was first observed in Tift County about February 15 and in Dooley County about one month later. At Athens, in north Georgia, the first sori were discovered May 2 on Georgia Red, Georgia Rust Proof, and

Cherokee. The nights have been unusually cool and there has been little rain, which probably accounts for the slow progress of the rust.

On May 6 wheat was observed between Athens and Macon and on May 18 between Athens and a point just north of Columbus. The season was somewhat more advanced in middle Georgia, but there was very little difference in the extent of leaf rust. Some fields were past the dough stage and the leaves and stems had turned yellow with practically no rust having appeared, while in a few the infection varied from 50 to 100 percent. An average of this area would probably be about 25 percent at a time when it is generally 100 percent.

An inspection trip was made on May 20 to the farm of Mr. Thomas W. Gilmore at Sandersville. Here, about 1100 acres of wheat, variety Coker's Red Heart, was mature and harvesting had begun. Most of it had died showing less than 25 percent leaf infection. According to Mr. Gilmore it was late in coming and advanced slowly. The loss from leaf rust in this field, as well as in the rest of the State, will probably be less than 10 percent this year.

There was a small plot of an introduced soft winter wheat on this farm. These plants, with the exception of a few distinct variants, showed complete immunity. There were a few very small necrotic areas on many of the leaves, but no actual sori. This was a good test for the physiologic forms of rust present on the Gilmore farm this year, because the variants, either segregates or mixtures, were heavily rusted.

The only disease on this wheat was powdery mildew (Erysiphe graminis), which occurred on about 10 percent of the leaf areas and even on glumes and awns. This is the first time the mildew has appeared on the farm since 1935 so it probably came in on seed grains.

Among the varieties on the Agronomy Plots at Athens C.I.5977 is mature and the leaves and stems died with practically no rust. Others, such as Georgia Red, Alabama Blue Stem, Cherokee, Red Hart, and Gasta are almost mature in the soft dough stage and show about 25 percent leaf infection. The late varieties, Fulcaster, Dietz Mediterranean, Mammoth Red, Stoner, Orlanda, and Wharton are in the milk stage and are about 5 percent infected. The Wharton (wheat x rye) shows less rust than any other of these varieties.

Stem rust (Puccinia graminis f.) was especially severe on the Gilmore farm last year, as previously reported, and centers in which all wheat was destroyed then were planted again last fall. The writer expected to find a heavy overwintering and much early infection, but this did not occur. Last October volunteer wheat here exhibited no rust, and now when the wheat is mature only a handful of scattering stalks could be found with stem rust in the entire field. Dry weather in the late summer and early fall must have inhibited the continuous uredospore crop.

Loose smut (Ustilago tritici) is much less in extent than usual. No field was observed with more than a trace.

Leaf spot (Septoria tritici) was found in most fields, but caused very little damage. The spotting occurred only on the lowest leaves that soon died even when not infected.

Oats

Crown rust (Puccinia coronata) appeared in south Georgia in February and caused some damage on susceptible varieties. At Sandersville on the Gilmore farm one field of about 450 acres inspected when almost mature showed some rust on the few green leaves. However, this infection came very late and will cause slight injury. North of Macon no rust has been found in any field up to this time, May 22, and harvesting has begun in many fields.

Loose smut (Ustilago avenae) showed less than a trace on the Gilmore farm and about 1 to 3 percent in most others. A few fields in Barrow County of untreated grain would probably run from 10 to 15 percent smut.

Rye

Leaf rust (Puccinia dispersa [P. rubigo-vera secalis]) was found in all inspections in May, but has caused very little loss.

Stem smut (Urocystis occulta). About 0.1 percent occurred on the College Farm. This is the first noticed here in many years.

Anthracnose (Colletotrichum graminicola) was found in one field near Farmington. The loss was about 10 percent in dead plants. This field had been in rye last year.

(University of Georgia College of Agriculture.)

OBSERVATIONS ON SMALL GRAIN DISEASES IN VIRGINIA, MAY 9 TO 15, 1939

S. B. Fenne

Rockbridge County: Five fields of wheat had from 5 to 10 percent of leaf rust (Puccinia triticina [P. rubigo-vera tritici]) on 90 percent of the plants. Powdery mildew (Erysiphe graminis) was found in all five. Two of these fields contained loose smut (Ustilago tritici). Two fields of rye contained a trace of leaf rust [P. rubigo-vera secalis].

Augusta County: Six fields of wheat were inspected; 90 percent of the plants had from 5 to 15 percent of leaf rust. All of the fields contained powdery mildew and three contained loose smut. The three fields of barley showed a trace of leaf rust and also powdery mildew and loose smut.

Rockingham County: Five fields of wheat showed from a trace to 20 percent of leaf rust on 90 percent of the plants. All of the fields contained powdery mildew and nematodes (Anguina tritici). Loose smut was observed in one field. Three fields of barley contained a trace of leaf rust. All of these fields had loose smut [U. nuda].

Shenandoah County: One field of wheat had 10 percent of leaf rust generally distributed. Powdery mildew and nematodes were also found in this field. Four fields of barley contained a trace of leaf rust, three of these fields contained loose smut and stripe (Helminthosporium sativum).

Frederick County: Three fields of wheat inspected showed a trace of leaf rust. Three fields of barley contained a trace of leaf rust, one field had stripe and all three had loose smut.

Bedford County: Nine wheat fields showed a trace of leaf rust, three powdery mildew, one loose smut, and three nematodes. A trace of powdery mildew was found in one field of rye and one of barley. The barley also had loose smut and stripe.

Barley stripe was also reported in Amelia County. Leaf rust of wheat was found very generally in most fields in southside Virginia.

These observations were made in cooperation with G. E. Matheny and R. L. Shaver, Bureau of Entomology and Plant Quarantine, United States Department of Agriculture.

(Extension Plant Pathologist.)

OTHER REPORTS ON DISEASES OF CEREALS

CEREAL RUSTS IN TEXAS: (May 10) The writer visited the small grain experiments at College Station, Temple, and Greenville during the past few days. Small grains are the poorest in central Texas that the writer has ever seen. Most fields of oats are so short it is doubtful if they can be cut unless combined. There is very little crown rust [P. coronata] in any of the sections of the State visited. A small amount of stem rust [P. graminis] of oats was found at Temple and Hillsboro, Texas. Leaf rust of wheat has done very little damage this season. Stem rust of wheat has spread very little from early infection centers in this county. There was very little stem rust even at Temple, Texas.

(May 20) During the past ten days, precipitation has been recorded on five days for a total of 1.12 inch. Heavy dews have occurred on all other days except one. Maximum temperature for the period was 91 and minimum temperature was 53. Partly cloudy weather has prevailed most of the time. These conditions have been very favorable for the spread of the cereal rusts. Although crown rust of oats still is not spreading very fast and will do little damage, stem rust of wheat is now spreading fairly fast. As wheat is fully headed and much of it well advanced, it seems unlikely that any material damage to the crop may be expected.

All small grains have improved materially during the past 15 days over prospects on May 1. Exceptionally fine yields and quality of barley are promised. Harvest of barley started yesterday. Fall oats are maturing a good crop of grain in spite of the very short straw. Spring oats have been greatly benefited by recent general rains. (I. M. Atkins, Division of Cereal Crops and Diseases, Texas Substation No. 6, Denton.)

CONDITION OF WINTER WHEAT IN KANSAS: (May 5) The winter wheat crop in Kansas deteriorated badly during the past 10 days. On April 22, 23, and 24 a high, dry southwest wind blew continuously. Wheat in western and southwestern counties that had looked excellent before that time dried out very rapidly and the leaves now have turned brown and many of them have dropped off. Private crop estimators have lowered their estimates from 12 to 6 million bushels during the past week. Most of the wheat in the western half of the State, except that on fallow, now is in a precarious position. Should rains occur within the next few days, it appears that there will still be considerable wheat to harvest in the southern and southwestern counties and in certain localities elsewhere.

The writer does not remember ever having seen winter wheat in such a patchy condition over such a large area as exists this year. It is almost impossible to make a general statement as to the stage of growth of the crop at the present time. It all depends on the particular field of which one speaks. Even in the same field one often observes some plants approaching the boot stage while others seem to be still in the winter condition. There also is a large area in the west-central part of the State where plants are still poorly anchored owing to dry top soil conditions. Such plants stand little chance of surviving the hot, dry weather.

Leaf rust which appeared at Manhattan on April 27 now is fairly well distributed throughout the eastern half of Kansas although it is not conspicuous anywhere as yet. Leaf rust can be found, as primary infections, in most fields in this vicinity after a few minutes search. Considerable infection has been present in south-central Kansas since late in the winter, but the spring has been so cold and dry that infection has not spread as rapidly as expected. So far no stem rust has been reported in Kansas. (C. O. Johnston, Cereal Courier 31: 37. May 10.)

FIRST REPORT THIS YEAR OF WHEAT LEAF RUST IN NEBRASKA: A specimen of P. rubigo-vera tritici on Cheyenne wheat was picked up by Dr. Quisenberry, May 10, at the Agronomy Farm, College of Agriculture, Lincoln. This is the earliest report in Nebraska this year. (James H. Jensen, Nebraska Agricultural Experiment Station.)

TOBACCO DOWNY MILDEW APPEARS IN MASSACHUSETTS

O. C. Boyd

The first observation of tobacco downy mildew [Peronospora tabacina] in Massachusetts this year was made today (May 23) in Easthampton, Hampshire County. The disease consisted of one apparently primary infection spot 2 feet in diameter and some scattered secondary infection in the same bed and in an adjacent bed. Plants in those beds will be ready for setting out in 7 to 10 days.

(Massachusetts State College.)

DOWNY MILDEW AND OTHER TOBACCO DISEASES IN KENTUCKY

E. M. Johnson

Downy mildew (Peronospora tabacina) was found today, May 11, in one Burley bed and one of dark fire-cured tobacco in Logan County east of Adairville. Both of these beds were used in 1938. Downy mildew was also found in Montgomery County near St. Bethlehem on May 7 in beds used in 1938. Beds in new sites in the neighborhood were free from downy mildew. In all beds where the disease was found the plants are nearly large enough to set.

Angular leaf spot and wildfire (Bacterium angulatum and B. tabacum) have been rather general in tobacco beds in southern Kentucky for several weeks. Both diseases have caused considerable damage especially in beds in and near woods or thickets. Wildfire has caused more damage than angular leaf spot. The latter disease has killed large areas in many plant beds. The affected plants develop the wet rot stage and in a few days dry up on the bed. Many farmers and some county agents confuse this stage of the disease with blue mold. In one area where many beds were being badly injured by wildfire, sprays were being applied for controlling blue mold.

Cold injury, characterized by a constriction of the partially developed bud leaves which are pale yellow to white, especially along the leaf margins, has been prevalent in nearly all Burley beds and in many One Sucker and dark fire cured beds in southern Kentucky. This trouble has been especially prevalent in beds covered with thin cotton.

(Kentucky Agricultural Experiment Station.)

DOWNY MILDEW ON TOBACCO IN OHIO

C. C. Allison

Downy mildew was definitely identified in a plant bed in Miami County on May 23. Since then it has been reported in the burley as well as in the cigar filler areas. Up until the present time we have had hot, dry weather so that development of the disease is very slow. Plants are in general somewhat delayed and infection is reported earlier than last year.

(Ohio State University College of Agriculture. May 26.)

TOBACCO DISEASES IN GEORGIA

Huey I. Borders

The growing season has been very peculiar, or unusual, this year, and in the vicinity of Hahira a tobacco barn is already packed and is in the process of curing at this early date, which, I believe, is one of the earliest dates in the history of tobacco in this section. The only field disease that has shown up this year has been the field-type of downy mildew [Peronospora tabacina], which was very prevalent a few weeks ago when we had a period of cool, cloudy weather with a good deal of rain, but since the weather has gotten warm and the temperature is staying up around 70 the disease has been entirely inhibited.

In a tobacco field of about two acres in the vicinity of Adel, Cook County, there is approximately 1 percent infection of the plants by the tobacco ring spot disease. The symptoms are very marked and typical. This is the only virus disease that has shown up in our section so far this year.

(University of Georgia, Extension Service. May 27.)

BACTERIAL RING ROT OF POTATO IN WYOMING

Glen Hartman

We are finding the new ring rot disease [Bacterium sepedonicum] to be very severe in Park County, Wyoming, and are also finding scattering traces of the disease in Albany, Laramie, Platte, Goshen, and Niobrara Counties. Since we made the first findings of this disease late last fall we are not yet sure just how prevalent the trouble may be.

(Wyoming Agricultural Experiment Station. May 23.)

PLANT DISEASES IN SOUTHERN CALIFORNIA

H. G. Mac Millan and O. A. Plunkett

The seasonal conditions in this general area have retarded the appearance and development of plant diseases. Crop growth has been delayed. The spring has been cool to cold, and the precipitation has been deficient. The leaf and stem diseases have not appeared in normal amounts.

ALFALFA: Leaf spot, Pseudopeziza medicaginis. General on alfalfa in the coastal section.

BARLEY: Rusty blotch, Helminthosporium californicum. Spotted in Riverside County. Severity increasing with maturity of plants. Loss 10 to 20 percent. The spores of the fungus as found were narrower than reported.

BEAN, LIMA: Root rot, Fusarium sp. General. Causes a yellowing of the leaves, and retarded growth of the plants, but so far with little death. The lateral roots mostly affected. Dryness of the soils seems to be a factor.

CARROT: Root rot, Fusarium sp. Individual fields. Leaves purple to yellow, with gradual dying from the tips. Small rootlets withered and dead. Crop may mature, but healthy tops are necessary for saleability. Dryness and field management a contributing factor.

Mosaic. Individual fields. Foliage generally attacked. Has not appeared to affect the crop development.

CELERY: Early blight, Cercospora apii. Traces.

Late blight, Septoria apii-graveolentis. Scattered slight infections. No loss.

Mosaic. Traces. No apparent losses.

OATS: Loose smut, Ustilago avenae. Up to 5 percent smutted heads.

SUGAR BEETS. Downy mildew, Peronospora schachtii. On young beets in the Oxnard district, 5 percent infection.

Rust, Uromyces betae. Light, general infection. Beets young, and loss not to be estimated. Riverside County.

WHEAT: Leaf rust, Puccinia rubigo-vera tritici. Light, general infection.

(Division of Fruit and Vegetable Crops and Diseases and University of California at Los Angeles.)

SUMMER MEETING
AMERICAN PHYTOPATHOLOGICAL SOCIETY AND NORTH CENTRAL GROUP OF PLANT PATHOLOGISTS

June 21-22-23, 1939

Program in Milwaukee, Wisconsin

Tuesday morning and afternoon, June 20, Joint Session with other Botanical Societies. Program on "Photoperiodism".

Program in Madison, Wisconsin

Wednesday morning, June 21, 10:30 A.M.
(9-12 A.M., Registration, Biology Building, University of Wisconsin.)
Joint Session with other Botanical Societies, Auditorium, Biology Building.
Welcome by President Clarence A. Dykstra and Dean E. B. Fred, University of Wisconsin.

Wednesday afternoon, June 21, 2:00 P.M.
Section A - Joint session with American Society of Plant Physiologists. Program on "Plant Nutrition".
Section B - Field Trip.
Section C - Inspection of Laboratories (Botany, Forest Products, and Plant Pathology).

Wednesday evening, June 21, 6:30 P.M.
Plant Pathologists' Dinner, University Club.

Thursday morning, June 22, 10:00 A.M.
Joint Session with other Botanical Societies (Dr. E. C. Stakman will give an invitation paper) Auditorium, Biology Building.

Thursday afternoon, Juna 22, 2:00 P.M.
Section A - Field Trip.
Section B - Inspection of Laboratories (Botany and Plant Pathology).

Thursday evening, June 22, 5:30 P.M.
Picnic for all botanists at Olin Park on Lake Mononn. Field clothes are in order. Reservations with Dr. R. I. Evans, Biology Building, at 50¢ per plate; by mail if possible, and in any case by Wednesday noon.

Friday, June 23, 9:00 A.M.
Field Trip.

Accommodations in Madison

Loraine Hotel, Park Hotel, and Belmont Hotel, on Capitol Square, rates $2.50 to $4.00.

Unit B of the new Men's Dormitories on Lake Mendota and near the Department of Plant Pathology will be open, with sections for families, for single men, and for single women. Rooms are all double with twin beds. Rates $1.50 per person per day. Children under 12 half rates. Make reservations with Dr. J. H. Stauffer, Biology Building.

Tourist cabins may be found on the highways leading into Madison, and Trailer Town is near Middletown.

C. R. Orton, President
R. S. Kirby, Secretary
A. J. Riker, Chairman, Committee on Local Arrangements.